

THE CHEMIST

January, 1954

VOLUME XXXI



NUMBER 1



DR. RAY P. DINSMORE
Receives Honorary AIC Membership
(See page 7)

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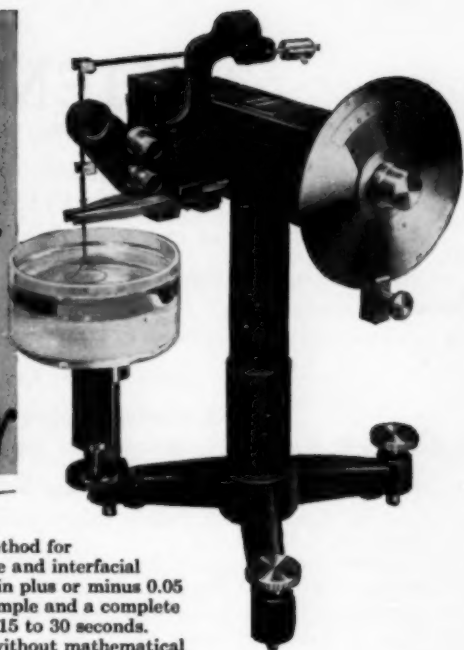
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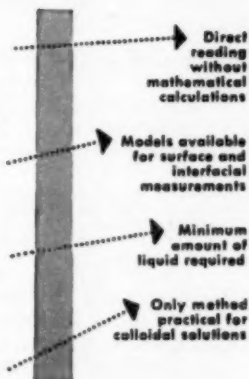
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The CHEMIST

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Publication of

THE AMERICAN INSTITUTE OF CHEMISTS, INC.

60 East 42nd Street, New York 17, N. Y.

Volume XXXI

January, 1954

Number 1

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Entered as second class matter April 8, 1936, at the Post Office at New York, N. Y., under Act of August 24, 1912. Issued monthly at 60 East 42nd Street, New York 17, N. Y. Subscription price, \$2.00 a year to Members, \$3.00 to Non-Members. Single copy, this issue \$0.25. Copyright, 1954 by THE AMERICAN INSTITUTE OF CHEMISTS, INC.

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TO COME

In February, Dr. Walter G. Whitman, head of the Dept. of Chemical Engineering at M.I.T., who received Hon. AIC Membership at a recent meeting of the New England Chapter, will speak seriously on his conviction concerning "The Professional Man and Defense." • There will be a report on the television show, "The Chemist," presented by the Ohio AIC Chapter. • The paper by Dr. Roger Williams on opportunities in the new field of polyethylene will appear. • An account will be given of the 75th Anniversary Celebration of the Chemical Society of Japan, to which Dr. Gustav Egloff presented greetings from the AIC. • Other features, new items, and AIC activities will add to professional information.

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EDITORIAL

Another Hunter Killed

Dr. Lincoln T. Work, F.A.I.C.

President, The American Institute of Chemists

"I heard a noise in the brush and thought it was a deer. I fired quickly so that the deer wouldn't get away. No, I did not know it was George. He shouldn't have been there."

IN THE hunting of subversives who would destroy the American way of life, we have a sorry record. Too long have we failed to realize that, though we as individuals may differ in many of our views, we must act together for the common good of our country. For many years, careful hunters of subversives have meticulously gathered data only to have it lightly treated or of little use because of legal limitations. Now, after much damage has been done, the public has become aware of the problem. Many hunters, both careful and careless, have taken to the field. There is a strong force of public opinion to insist that this problem be taken seriously and that it be solved.

As scientists, we are a component of that force and we should do our best to view the situation wisely and fairly. We should not take rumor for fact and allege guilt before the truth is out. Reports of men questioned and fully cleared show that false rumor dies hard and that serious toll is exacted by the careless hunter of subversives.

Nor may we generalize that an

institution is bad merely because there are some subversives found in it. Recent attacks on universities bear this out. Let us remember that they are training youth for the decades ahead and that they must therefore lead our thinking toward a better America. We ought further to remember that out of their scientific attainment has come the strength that subversives would take and destroy. Proper perspective will allow us to see their great value in technical contributions and in the maintenance of liberty. Meanwhile stern measures should be taken to root out subversives who are doing injury to our American way of life.

Elected: Robert D. Bonney, F.A.I.C., as vice president of manufacturing for Congoleum-Nairn, Inc., of Kearny, N. J. He has been director of manufacturing for the company since 1951, and he joined the company as chief chemist at the Marcus Hook, Pa., plant in 1918. He is a director of the American Standards Association. In 1952, he received the PaVac Award of the New York Paint and Varnish Production Club.



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The Noiseless Foot of Time

Dr. Ray P. Dinsmore, Hon. AIC

Vice President in charge of research and development, The Goodyear Tire and Rubber Company, Akron 16, Ohio

(Acceptance address when the author received Honorary AIC Membership at a meeting of the Ohio AIC Chapter, October 30, 1953, at Akron, Ohio)

IT IS the habit of youth to think that the world has always been as they have experienced it in their brief lifetime. It is the custom of age to assert that the good old days have gone, and that everything is going to the dogs. Aside from the natural disparity in viewpoint created by excessive optimism on one hand and pessimism on the other, the error of both is caused by failure to consider a large enough segment of human experience. Even the longest memories and those traditions handed down with more or less accuracy from generation to generation are inadequate in either their breadth or their depth to put one's present existence in its proper perspective. This can be done only from the reading of books or from listening to those who have garnered their store of information from the wide and intelligent reading of books.

My boyhood was spent in New England. I retain as one of my strongest impressions of the New England atmosphere the importance that was placed upon reading. Everybody read books — young and old, rich and poor — and they were read both

aloud and in the quiet of the family circle. There was no censorship either, in the family exercise of it at least, or any particular guidance. When I was about twelve, I read one winter Milton's "Paradise Lost," George Ade's, "Fables In Slang," and a considerable number of G. A. Henty's books of adventure for boys. Looking back, I think I probably got as much good out of one as out of the other!

When I finished my work at Massachusetts Institute of Technology, I was so fed up with learning facts that I picked up the reading of philosophy, and for several years found great enjoyment in studying the way various prominent philosophers had built up generalizations from the facts available to them. It had the unintentional effect of making me acquainted with a great deal of sociological and historical data that I probably otherwise would never have taken the trouble to examine. It laid the foundation for a degree of tolerance, which while inadequate, was undoubtedly greater than I otherwise would have obtained.

We must look below the surface,

if we really want to understand people. It is commonly supposed that only an out-and-out extrovert likes people, and that those who do not exclaim aloud and manifest exuberance at the appearance of any group of people no matter how constituted, refrain from doing so because they are natural misanthropes. This is certainly not always the case, perhaps not generally the case. Many quiet people are more genuinely sympathetic in their viewpoint toward others than many of the back-slapping variety.

It has been important in most of my business career to reconcile the viewpoints of people with different backgrounds and characteristics, and it seems clear that the most serious differences and those that are most difficult to reconcile arise from inability to find a basis of mutual understanding. This usually results from a lack of a sufficient amount of common experience to generate a common viewpoint.

Since I reached maturity, I have been thankful that in my early youth I had to do a considerable amount of hard manual labor; that I had to spend long hours of my best mental effort to complete my college work, and that for a considerable time, both before and after I left school, I had a totally inadequate amount of money. Without these experiences I would not have been able to understand the interaction of economic forces with the attitudes of the peo-

ple affected by them, or to have anything like a sympathetic insight into the problems of others less fortunately situated.

The Expansion of the Rubber Industry

It seems to me that it could hardly have happened that anyone could have entered the rubber business at a time when there were more important things to be done and more exciting changes taking place. Most of us now feel that our knowledge of fundamentals in the rubber business is woefully deficient. However, when I consider how far we have advanced in the thirty-nine years that I have been a spectator, I realize that we should not feel too much disappointment, nor need we doubt that the acquisition of fundamental information in the future will go on at a more accelerated pace.

In my early years in Akron, chemists and other technical men from the rubber companies only got together at alumni gatherings, or other outings of community interest. There was little interchange of ideas, and in fact anything of this kind was frowned upon. We felt that we were the center of activity of the rubber business, but were frustrated in any means of giving expression to our ideas as a body.

Returning to Akron after five years' absence in Canada and California, I found that the newly-organized Rubber Division of the

THE NOISELESS FOOT OF TIME

American Chemical Society was coming alive, and the Cleveland section of the Chemical Society was pulling members from Akron, so we began to think about our own local section. The development of the freedom of discussion among rubber chemists, both in the local Akron section and in the national Rubber Division, is one of the most interesting phases of our expanding technology. Problems were so numerous that there was no difficulty in selecting those that had no immediate competitive complications. Men from various companies attacked these problems in committee or individually, and their findings were subject to the liveliest critical discussion. Lifelong friendships were formed that helped to achieve and maintain some of the highest professional standards boasted by any industry. No one who participated could doubt that friendly relationships and an understanding of the other fellow's problems are priceless assets in achieving important results.

The technical mazes were traversed in the 20's and 30's by men whom we can now see were outstanding pioneers. It seems odd to recall that the control of vulcanization, on which the quality of our rubber products so strongly depended, was so crude and unreliable. I remember when we first introduced the original recording thermometers into the curing room or pit, and the ridicule with which they were received, and the unexplain-

able variations demonstrated. Prior to then the steam gauge had been the only control instrument, and that had to be assisted by manual operation of the steam valve and reducing valve. A number of years had to elapse before we discovered the needful means of eliminating temperature variations caused by air pockets in the heaters.

To find out whether a tire was uniformly vulcanized we had to make combined sulfur determinations for times and temperatures of cure in the laboratory and then compare these with actual sulfur determinations in various parts of the tire; a slow and tedious process, not too good a control because of its percentage error and the impracticability of making enough determinations to get a good statistical average. It showed very little about individual heater variations. However, after Don Granor published a method of determining temperatures in various parts of a tire by the use of thermocouples, Walter Vogt and Ralph Day worked out a method to convert the temperature curves so obtained to an equivalent vulcanization at a standard temperature, and vulcanization control began to make real progress.

Through the years as the industry has gone through various phases including many outstanding improvements in methods and technology, I have been impressed with the fact that while ideas are of great value, and some people have more and bet-

ter ideas than others, it takes enthusiastic cooperation of a lot of people to realize the ultimate benefit from any idea.

If I have created the impression that cooperation is a factor superior to competition, I may say that both things are valuable to industry's advancement, and one should not stifle the other. There is always a large margin of overlapping interest in an industry where it pays everyone to cooperate to advance the industry and thus make it more secure against the encroachment of other industries. There is likewise a large area of direct competition that keeps everyone alert to do his best and offer the most valuable service to the public. No industry could have been more competitive than the rubber industry, and at the same time there has been a strong area of cooperation to meet industry-wide problems of a technical nature. Because of their background and knowledge of each other, there is a large group of people in the field of rubber technology who have mutual confidence in their dealings with one another and who yet are certain that each is going to represent the competitive interests of his company to the best of his ability. This kind of relationship is one of the finest things that any professional man can enjoy.

Over the years we have seen organic accelerators introduce economies and quality factors undreamed

of before their advent. Carbon black reigns supreme as a reinforcing agent, and has recently become one of our most versatile pigments. Rayon, wire, and nylon have become common constituents of tire carcasses, and in a short ten years synthetic rubber has grown to become the most serious threat that plantation rubber has ever faced. Antioxidants have become a commonplace compounding constituent, and we must remember the invaluable assistance supplied by such laboratory tests as the Geer Oven and the Rierer-Davis Bomb.

The wonderful transformations made in the mechanical equipment for the manufacture of rubber goods have taken a large part of the drudgery out of the building of tires and other products, and have enormously increased the productivity and economy of our factories. I am trying to give you a glimpse of the significant part played by the relationship between individuals not inspired entirely by selfish motives of power or wealth, but more often by a burning enthusiasm for accomplishment that they felt was important to themselves, to their employers, and to the industry, and a willingness to be aided by colleagues with similar motives.

I have commented on the difference in viewpoint between young and old people. This is illustrated by the different attitudes displayed by those who have lived through the expansion of the rubber business, and per-

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haps, like myself, with one of the individual companies in the rubber business, and those who have more recently entered its boundaries. The old timer has acquired his knowledge of the various details of the business gradually, but thoroughly, in the easy way by living through it, while to the young man the present status of the industry has a deceptive appearance of permanence. The older man is apt to deplore certain defects in judgment displayed by the young, forgetting that they lack an equivalent background, and perhaps in many instances, are not even aware of the necessity of acquiring one. If this is true of the rubber technology itself, it is even more true of the large company where the details of change and growth are not available in the textbooks, and an acquisition of background knowledge covering the functions of the various divisions in business and the foibles and idiosyncrasies of its key people is difficult to obtain.

If a correct viewpoint and balanced judgment depend to a considerable degree on logical association of the present state of things with a sufficient segment of the past, then our training of young men should contemplate not only a working acquaintance with as large a part of the present state of things as is possible to supply them, but also enough of the historical background to show how and over what period the pres-

ent condition was achieved. This is a difficult assignment, and in view of the prevalent inadequacy in training programs which attempt to cover only the present status, the injection of an historical note may seem highly impractical, yet those who attempt and achieve any measure of success with it will be richly rewarded.

The Problem of Finding Executives

All executives complain about the difficulty in finding people with the right personality, ability, and experience to fill important executive jobs. The more important the job, the more difficult it appears to be to find the right man to fill it. This goes back to the fact that adequate training programs were not adopted years ago, so that men with special executive ability could be discovered and given an opportunity to supplement their experience and develop their talents. As a result, men must be selected with inadequate experience and inadequate testing, which is hard on the individual selected and equally trying for his superior, and not infrequently results in either a mediocre result or total failure.

These problems with important executive jobs are repeated many times over in the filling of less important positions. For this reason, I do not believe that the best way to find out if a man can do a job is to give him the job and let him try it. Experience is still the best teacher. It should not



Left to right: Albert J. Gracia; Dr. A. A. Somerville; AIC President Work, Dr. Dinsmore; Dr. Norbert A. Lange, Ohio Chapter Chairman.

be expected to give the equivalent of a four years college course in three weeks. Systematic planning in this, as in most other things, produces by far the best results.

It is always difficult to find the extra time required to train people, and this difficulty applies to the people that are being trained as well as the people that are training them. It is far easier to put a man on a job and let him build up his experience where he shortly becomes more and more useful, than it is to move him about from place to place where he does not contribute a large amount of useful effort at any time in the course of his training. Moreover, if he is an outstanding individual everyone that he works for wants to keep him to do their particular work, and

there is general resistance all along the line to the completion of a course of training. In these days of serious shortages of engineers and scientific people it will be impossible to keep a training group 100 per cent intact. Business emergencies that cannot be gainsaid will decimate the ranks. However, even so, an obstinate adherence to the original purpose is a moral obligation of the executive in charge.

Many people have posed the question as to how to do some remedial training for budding executives who have not had the advantage of the proper earlier training. Here it is more difficult to pry these men off their present jobs when they are showing real ability in order to move them about and give them broader

THE NOISELESS FOOT OF TIME

experience and contact with a larger segment of the organization. Obstacles can be overcome and the result can be accomplished if there is sufficient belief in its necessity. It may be necessary to create jobs that would not be essential, if we were functioning with a systematically trained and adequately staffed organization, but whatever is necessary should be done even at the advanced stage, to avoid those grimmer necessities brought about by vacancies in top executive positions that must be filled by untried and untrained individuals because no others are available.

If you detect the glint of a gold thread in this rather drab fabric that I have been weaving for you, you will perhaps agree that it is the importance of human beings and the

fact that they respond to the proper stimulation in an environment that permits them to achieve results through congenial cooperation with their fellows.

Forward and back, under my doubtful
searching gaze

Shimmers Life's path pressed by the
'noiseless foot of Time',

Which, hurrying onward never stops
nor even heeds

That the past vista far exceeds the one
before

Like baubles on a Yule tree, side by side
Dangle my deeds — dusty and worn —
some black, some pale.

Though, lonely, here and there a gleam
reflects the sun.

So like a child clapping its hands at
Christmas lights,

I smile and think this brilliancy bedims
the rest.

Although I cannot see or think just
what the deed

Or whence it came, or why I, childlike,
am content.

Accomplishments of Dr. Dinsmore

Albert J. Gracia

Manager, Goodyear Atomic Corporation

(Presented at the meeting of the AIC Ohio Chapter, when Honorary AIC membership was given to Dr. Ray P. Dinsmore.)

WE LIVE in a dimension conscious age. Everyone is alert and alive to the picturization that comes with the use of dimensional language. The custom creeps into our daily speech and we say that the football team that beat our favorite had 'em four deep; that our bridge game suffered because the suits had no length; that a situation is as "broad

as it is long" and that if you give some people "a foot they will take a mile."

The current interest in three-dimension movies stems from the fact that two-dimensional viewing develops not only unreal aspects of the object but is often deceiving, while the element of depth perception present in 3-D puts the viewer into the

act so to speak — as you discern when the man in the seat in front of you ducks to avoid the outthrown missile.

So we seek to honor our Award recipient by detailing his dimensions, his height, his breadth, and his depth. Perhaps the analogy is an appropriate one, and we can consider under his height those aspects of his accomplishments in science, technology, and administration. Under breadth we can consider the extent to which he has moved outward from the core of his specialization into the wider area of vocational and non-vocational pursuits having a bearing on the "whole-man" in his dual relationship to his job and his society. As to the dimension of depth we will say something about his concern for good human relations as evidenced by his personal devotion to that eminently worthwhile goal.

The record of his height is in the history of the advancing technology in the rubber industry as it has been recorded over the last forty years. And it reads like this: Dr. Dinsmore, native of Tewksbury, Mass., was graduated in 1914 from the Massachusetts Institute of Technology and joined Goodyear in its experimental department in Akron to work on technical service and compounding problems. Sent to the Bowmanville, Ontario, Canada, plant of the company in 1916 as compounder, he became assistant chief chemist at the New Toronto plant in 1917. Then

in rapid moves he was made chief chemist at the Los Angeles plant in 1919 and chief chemist of the parent company when he was returned to Akron in 1921. In 1932 he was appointed assistant to the factory manager and was assigned the responsibility of new product development. While in this position he directed the activities that resulted in Goodyear's rubber hydrochloride protective film and the rayon cord tire. In 1939 he was promoted to the position of development manager. In this position, and with the outbreak of the European War as a stimulus, he decided to exploit the synthetic rubber research and development then some few years under way at Goodyear. He ordered the design and erection of a pilot plant unit to produce one ton of synthetic rubber a day. With our national involvement in the war some two years later this pilot unit supplied much data for Rubber Reserve's synthetic rubber standard plants design. There is no way adequately to assess the foresight which provided this valuable prototype except to say that when time was of the essence it was available to the whole industry for its program of cooperative synthetic rubber development.

In recognition of this kind of leadership, Ray Dinsmore was awarded an honorary degree of Doctor of Engineering by Case Institute of Technology in 1940. Further honors came when he was appointed assist-

ACCOMPLISHMENTS . . .

ant deputy rubber director working with Bradley Dewey during the war until May of 1943. In this position he organized and directed research and development work on synthetic rubber for the Government and coordinated the activities of both industrial and university laboratories.

Returning to Goodyear he was elevated to the office of vice president in charge of research and development and immediately followed through on the tough problem of applying the new synthetic to rubber product manufacture.

In recognition of his outstanding contributions in the field of synthetic rubber development and application, the Institution of the Rubber Industry awarded him the Colwyn Gold Medal for 1947 in impressive ceremonies in London, England.

An able and literate writer of technical papers on rubber, vulcanization of rubber, tires, plastics and rubber chemicals, Dr. Dinsmore has also been the author of numerous articles with reference to both technical and economic problems associated with synthetic rubber. He has contributed chapters to several technical books and is a frequent lecturer to scientific groups where his presentations have recently ranged from "The Human Element in Research Exploitation" to "The New Goodyear Rubber Chemigum SL".

While compiling this notable record of achievement he has taken time

to participate actively as member and as an officer in The American Chemical Society, the Akron Rubber Group, the Society of Chemical Industry. He is a fellow of the Institution of the Rubber Industry, of THE AMERICAN INSTITUTE OF CHEMISTS, of the American Association for the Advancement of Science and of the Royal Society of Arts, as well as a member of the American Institute of Chemical Engineers, of the American Academy of Political and Social Science and the Society of Automotive Engineers.

These are the delineations — the brief delineations of his height.

The Dimension of Breadth

We tend to think of the dimension of breadth in connection with the extent to which an individual reacts openly and receptively to the interplay of all the elements bearing upon the conduct of his work assignment and his avocational interests. Judged in this light, Ray Dinsmore is a broad man indeed. For not only has he brought to his immediate work the detailed knowledge and the absorption of the specialist, but he has, far more than that, brought also that rare insight of the generalist, the sure knowledge that in every work situation there develops a variety of approaches limited only by the number of human beings involved.

To the end that these humans being might be informed persons, he has long made it an overriding policy to

have people in training as replacements at all level of supervision in his organization. This has not been an easy thing to accomplish — indeed it is never simple in any organization — but the idea of the individual responsibility of an administrator to train his replacement is well understood in the Goodyear research and development organization.

An indication of the effectiveness of this policy came at a time Goodyear Atomic Corporation was being staffed with key technical employees. Dr. Dinsmore's division provided twenty-five of the slightly more than one-hundred people assigned. I have not heard that the parent development organization has been one whit less effective as the result of this depletion, but on the other hand, on many occasions I have been extremely grateful for the quality of the personnel that came from this enlightened system.

In connection with the policy of training, I must mention Dr. Dinsmore's own sensitive and perceptive approach to the problem of executive development through the technique of "coaching." One of the premises underlying his view is that problems and situations almost never repeat themselves, hence the trainee must be guided in methods of attack and ways of thinking, rather than in specific answers on principles. Another basic premise of the Dinsmore approach is that people cannot be taught adminis-

trative skill but will learn it themselves if confronted with situations calling for the exercise of judgment. So you would find daily in your mail basket, if you were attached to the Office of Vice President for Research and Development at Goodyear, a number of problem situations posed by actual business correspondence, with the terse notation in Dr. Dinsmore's handwriting, "Let me have your recommendations," "What do you say to this," or just "Please handle." He knows that the breadth of judgment required of a seasoned executive is a function of experience and he also recognizes the fact that the man of promise can acquire that experience only if his boss consciously makes it possible. Thus by setting the example and encouraging others to do likewise, he has developed a very substantial training program quietly and effectively. So his broadening influence is felt throughout the corporation.

Other aspects of the dimension of breadth are to be found in Dinsmore's lively interest in the world about him — the whole world, natural, political, economic and social: Hunter and fisherman; reader of detective fiction; student of political movements and economic trends; raconteur extraordinary.

The Dimension of Depth

Finally there is the dimension of depth. How shall we measure these innate qualities of humanity and humility which make of their posses-

ACCOMPLISHMENTS . . .

sor a leader instead of a driver; that produce in people the desire to go forward together . . . not because they must but because the spirit moves them to do so? It is the most difficult dimension to detail because it is the one about which we are most self-conscious. We say that it is not in our tradition to "wear our hearts on our sleeves." And yet it is this dimension that gives meaning to life, and life to our days.

When I wrote to a classmate of Dinsmore's, a long-time Goodyear associate now retired, he wrote back promptly: "No recognition would be complete if it did not highlight Dinsmore's devoted loyalty to his associates. He was a real friend to me and a square dealer to all his people. A more generous soul does not exist."

The example that is created as a result of an executive's ideals and goals does much to foster similar sensitivities in the whole group, for it is said that an organization is but the lengthened shadow of its leader. So Dinsmore has set standards of integrity, standards of fairness, standards of respect, standards of recognition and reward that have generated a climate in which technical and scientific personnel can work freely and fully with no other consideration save that the worthwhile ends of research and development, as they apply to Goodyear's business, be pursued diligently, honestly and effectively. To the true scientist or technologist this

is a perquisite fervently sought and rarely found.

There is abroad today in industry an aspect of enlightened self-interest that is keyed to the notion that there are certain imperishable fundamentals of the human spirit and that the business which recognizes these fundamentals and organizes itself so as to direct a sensitive concern towards its customers, towards its stockholders, towards its employees and towards its community, that business will be, in the years ahead, the most successful and the most profitable. If this ideal catches on broadly in the future, it will be because of the personal examples set by men like the one we honor.

Presentation

DR. RAY P. Dinsmore, F.A.I.C., vice president in charge of research and development of the Goodyear Tire & Rubber Company, was presented with Honorary Membership in THE AMERICAN INSTITUTE OF CHEMISTS, at a meeting at the Ohio AIC Chapter, held October 30th, at the Mayflower Hotel, Akron, Ohio. Preceding the dinner, an informal reception to Dr. Dinsmore was given by the Goodyear Tire and Rubber Company.

The welcoming address was delivered by Ohio Chapter Chairman, Dr. Norbert A. Lange, editor, Hand-

book Publishers, Inc., of Sandusky, Ohio.

Dr. A. A. Somerville, vice president of R. T. Vanderbilt Company, spoke on the "Personal Attributes of Dr. Dinsmore," but restricted his comments to light spoofing, except for one serious moment: "I have had the habit for several years of asking a group of men to go on a fishing trip. It takes time, several weeks or even months, to arrange such a trip, and when two or three get together in advance of the party, the first question they invariably ask is this: Is Dinny going to be there? That is one of the highest tributes of friendship that any man can pay another man."

"The Accomplishments of Dr. Dinsmore" were outlined by Albert J. Gracia, manager of Goodyear Atomic Corporation.

Dr. Lincoln T. Work, AIC president, presented the certificate of Honorary Membership to Dr. Dinsmore, who responded with "The Noiseless Foot of Time." The citation on the certificate reads:

To Ray Putnam Dinsmore

In appreciation of his inventive genius in rubber chemistry, his leadership in research, and helpfulness to his brother chemists.

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Gold Medal to Dr. Sparks

Dr. William J. Sparks, F.A.I.C., director of the Chemical Division and coordinator of Exploratory Research for the Standard Oil Development Company, has been selected to receive the 1954 Gold Medal of THE AMERICAN INSTITUTE OF CHEMISTS.

The presentation of the medal will be made at the AIC's Annual Meeting, to be held at the Berkeley-Carteret Hotel, Asbury Park, N.J., May 12-14, 1954. (Details will appear in later issues of THE CHEMIST.)

Dr. Gustav Egloff, Hon. AIC, chairman of the Jury of Medal Award, announced that Dr. Sparks was cited "as an eminent chemist who has striven unceasingly for the promotion of the science of chemistry and the professional advancement of the chemist."

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The Prevention of Deterioration Center —A New Approach to Conservation

Dr. Glenn A. Greathouse, F.A.I.C., Director

Dr. Carl J. Wessel, F.A.I.C., Assistant Director

Bryson Fleer, Editor

*Prevention of Deterioration Center, National Research Council,
2101 Constitution Avenue, N.W., Washington 25, D.C.*

CONSERVATION, in the sense of judicious utilization of natural resources, is scarcely a new idea. Within the memory of those now living, there has been no time when the Nation was without concern over rapidly disappearing supplies of all kinds. Today the problem is, if anything, even more critical. Recently the President's Materials Policy Commission reported (1) that "consumption of almost all materials is expanding at compound rates and is thus pressing harder and harder against resources which, whatever else they may be doing, are not similarly expanding." This situation, coupled with the wasteful exploitation of earlier years, and with the extensive drain of two major wars, has dangerously depleted sources of certain raw materials. Lavish use of copper, zinc, and lead in the United States has so reduced available supplies that imports are now necessary to supplement domestic production. Concern over approaching exhaustion of iron ore in the great Mesabi range continues to be expressed in current

technical literature. Repeated warnings are still issued to urge conservation of remaining forests.

A New Approach

In such a state of affairs, it is evident that a new approach may be essential both for the defense of the free world and for our own economic future as well. Not only is it necessary that wise use be made of such resources as remain; needed also are methods and techniques for extending the useful life of manufactured items already in existence. That material goods are unduly shortlived and subject to gross degradation by environmental elements has long been recognized. Our industries pay heavily for it, and the home-owner is confronted with one or another aspect of the problem almost daily. Consciously or unconsciously, it is generally appreciated that iron and steel structures rust unless regularly and adequately protected, rubber and leather goods become hard and crack, wood decays unless appropriately treated, and expensive machinery is often ruined by corrosion. Yet the total annual eco-

nomic losses directly ascribable to deterioration in the United States are undoubtedly much higher than is commonly realized.

Staggering Costs

A railroad using one million ties can save \$150,000 by increasing the life of ties by a single year (2). According to Snyder (3), termite damage costs this country about \$40 million annually. Speller (4) reports that corrosion of oil-refinery equipment has been estimated to add one cent a gallon to the price of gasoline. Uhlig (5) assays the yearly national cost of corrosion at between \$5 and \$6 billion. Stirling (6) estimates the loss in buried pipe alone at \$5 million. Rhoads and Clapp (7) say that yearly losses from marine-borer attack on wooden structures in waters around the United States amount to \$50 million. Moncrieff (8), reporting figures of the Better Fabrics League of America, states that the annual U.S. loss due to moth damage to fabrics amounts to \$100 million, while Mosher (9) hazards a guess of \$200 to \$500 million. In short, a total monetary estimate of up to \$12 billion annually from all forms of deterioration, excluding that of food-stuffs, is probably quite conservative.

The Origin of PDC

Only recently has it come to be appreciated that every deterioration problem may be explained in terms of clear-cut chemical, physical, and biological criteria. The intensive

practical application of scientific principles toward preserving manufactured goods has now come to be known simply as "deterioration prevention," a sort of science in itself. A comparatively new development, it stems from the experience of the Armed Forces in the early years of World War II, when deterioration of Service equipment became a serious problem in military operations. Equipment with a predictable life in terms of months or years when used in temperate climates became inoperable in a matter of weeks when shipped to the tropics or to polar regions.

In the United States, among the first to recognize the gravity of the maintenance problem were certain forward-looking officers and civilian scientists in the Navy Department. Of course the Army was faced with similar problems. After a series of discussions, the two Services cooperated in the establishment of a Joint Army-Navy Deterioration Steering Committee under the National Defense Research Committee. Together with the necessary subcommittees, it set out to analyze the needs of the Armed Forces and to determine means of satisfying those needs. Subsequently, with the establishment of the Office of Scientific Research and Development in June 1941, the Tropical Deterioration Information Center was instituted using the services and facilities of The George Washington University.

PREVENTION OF DETERIORATION . . .

Through recommendations for emergency measures, substantial improvements were effected by the combined efforts of these two coordinate groups. By the close of World War II, the activities had clearly demonstrated their continuing usefulness. In 1945, therefore, the Office of Research and Inventions of the Navy Department recommended a more permanent organization. The functions of the wartime Steering Committee were transferred to a new Joint Army-Navy Deterioration Prevention Committee, and the group at the University was reconstituted, as the Prevention of Deterioration Center, under an ORI contract with the National Research Council. Some months later the Army, also recognizing the continued value of the work, joined with financial cooperation, and, when the Department of the Air Force was created as a separate Service, it joined in the effort with a cross-Service order of its own.

PDC thus eventually came into being with the sponsorship and financial support of all three Services of the Department of Defense. Broad guidance in fiscal matters now is provided the Center by the Services Technical Committee composed of representatives of the Office of Naval Research, the Army General Staff, and the Wright Air Development Center. Advice and counsel on scientific matters is afforded by a Scientific Advisory Committee appointed by

the Chairman of the National Research Council, and made up of recognized authorities from universities and industry.

Cooperation of NRC

The contractual arrangement with the National Academy of Sciences has proved to be exceptionally effective. The National Research Council, as the operating unit of the National Academy of Sciences, while clearly recognizing the indispensable value of individual investigation, helps to integrate the work of individual scientists and assists in coordinating attack upon large problems in the field of scientific inquiry. It is perhaps best implemented for service in connection with problems whose successful solution depends upon close cooperation of many workers and many laboratories concerned with a single science or of those concerned with several fields in which various parts of an over-all problem may lie. Such a case is the problem of material deterioration, where technical work draws upon all the basic sciences and upon their practical application. Because of its relationship to the National Research Council, the Center is particularly well suited to help in the solution of deterioration problems.

Services and Activities

PDC is at once a consultative body on highly specialized technical problems, a research organization, and a scientific information collecting and disseminating agency. The technical

staff is composed of a group of specialists so trained in the various branches of physical and biological science that together they may attack a given problem team fashion. It serves in an advisory capacity to all agencies of the Department of Defense concerned with combating the impairment of materials, components, and assemblies of equipment and pursues investigations on specific problems not treated adequately elsewhere.

As in any other research and consulting group, a prerequisite is easy access to the latest literature in the subject fields concerned. Since the literature of deterioration is so voluminous, PDC maintains for this purpose a library staff to collect, catalog, and index pertinent technical data and a publications group to summarize and condense incoming technical reports, of which some 15,000 have been accumulated. Probably no other library in the world contains a more complete collection on the subject of deterioration, and all documents are available for loan to authorized persons.

The activities of the publications staff give rise to the *Prevention of Deterioration Abstracts*, an instrument of two-fold value. First, the ready access by the staff to these abstracts, and to the reports they represent, is indispensable in the consultative and research aspects of the Center's work. Second, the abstracts are

distributed to the research and development groups in the Department of Defense to aid in solving problems of deterioration of materials. By permission of the Department of Defense, the abstracts have also been made available on a subscription basis to industry and private research organizations at home and abroad. Currently the abstracts cover some 900 to 1000 reports per year, run to a total of about 2000 pages annually, and are distributed to about 500 users.

Although there are in existence numerous texts on corrosion, wood decay, paint failure, and similar specific deterioration problems, there has been no single published source of information on the behavior of materials under the influence of deteriorative factors. In an attempt to meet this need, the Center, with the assistance of some 25 specialist contributors, is completing preparation of a large and highly documented collaborative volume entitled *Deterioration of Materials — Causes and Preventive Techniques*. Intended as a reference work and source book on the latest methods of deterioration prevention, it is scheduled for publication and sale by a commercial publisher early in 1954.

One very widespread problem in deterioration is that arising from the action of fungi. Soon after the establishment of PDC, the Joint Army-Navy Deterioration Prevention Com-

PREVENTION OF DETERIORATION . . .

mittee formed a Fungicide Subcommittee. It had as one of its principal accomplishments the adoption of a standard test method for the screening of organic compounds as fungicides. For several years, a cooperative fungicide screening program was carried out by a number of agencies of the Department of Defense as well as by PDC. Thereafter the bulk of the screening was assumed by the Center, employing facilities at the University of Maryland. Thus far the Center has collected over 10,000 compounds from all sources and has evaluated, coded, and indexed detailed information on their fungitoxicity. Of this large number, approximately 1% are of sufficient promise to warrant further testing by Department of Defense laboratories, to whose attention they are called. It is apparent that this work relieves Government laboratories of the task of preliminary testing of large numbers of compounds.

The Objectives

What, then, are the objectives of the Prevention of Deterioration Center? Briefly summarized, they are these:

1. To collect information from Government, industrial, and academic institutions on problems relating to the prevention of deterioration of materials and to make such information available in readily usable form.
2. To serve the Department of Defense in a consulting and ad-

visory capacity on deterioration prevention.

3. To conduct studies and surveys in pertinent fields of interest.
4. To stimulate research in the field of deterioration prevention, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare.
5. To promote cooperation among research workers engaged on the several aspects of deterioration prevention.

With such a program, it is apparent that the philosophy is one of active attack upon all the long-standing problems of materials deterioration. This, in itself, is new. For people have too long been accustomed to looking upon deterioration as the inevitable manifestation of material things. Moreover, that the responsible officials in the Military Services saw fit, in 1945, to continue support of the work toward deterioration prevention has since clearly proved the better part of wisdom. Many of the methods and techniques later developed have found widespread application in the difficulties in Korea. Within the past nine years, numerous Government specifications have been rewritten to conform to the latest and best practices. While the Prevention of Deterioration Center does in no way claim credit for the improvements effected, it is just-

tifiably proud of having contributed to some of them. Today the United States finds itself in possession of more material wealth, military and civilian, than ever before. PDC is dedicated to the task of helping to preserve some of it by application of latest knowledge in all the fields of science involved.

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Created: An Industrial Economics Department by Southwest Research Institute of San Antonio, Texas. C. A. Harrell was appointed chairman.

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Meeting: Of the M.I.T. Club of New York, Inc., 115 E. 40th St., New York 16, N. Y., will be held on February 24th. Dr. Clarence B. Larson, director of the Oak Ridge National Laboratory, will speak on "Progress in Atomic Energy Utilization". The dinner will be held in the Baroque Room of the Brass Rail Restaurant, 100 Park Ave., (40th Street entrance). There will be opportunity to meet Dr. Larson between 6:00 and 7:00 p.m.; dinner will be at 7:00 o'clock and the talk will begin at 8:00. Readers of THE CHEMIST will be welcome. Reservations for the dinner should be made with the M.I.T. Club before February 20th. Tickets are \$5.00.

Communications

Well Running Dry

To Readers of THE CHEMIST:

The supply and demand of secondary-school teachers of science, extrapolated to the extent of the probable demands of children already born, were studied by a group of scientists and educators at Harvard University in July and August, 1953. The Conference was supported by the Carnegie Corporation of New York. The findings of the Conference are concerned with nation-wide problems in science teaching in the secondary schools. Copies (how many?) of the report of the Conference, "Critical Years Ahead in Science Teaching," may be secured without cost by sending a self-addressed label to Elbert C. Weaver, Chemistry Department, Phillips Academy, Andover, Mass.

—ELBERT C. WEAVER, F.A.I.C.

Always Read All of The Chemist!

To the Editor:

It was disturbing and disappointing to note the treatment accorded Dr. Eisenschiml's talk, "Self Inventory," in your October 1953 issue.

Surely despite the fact that this talk was presented at a local Chapter meeting it was of sufficient national interest to merit something better than a footnote at the back of the book.

It has always been a matter of

amazement to me that a profession founded on critical analysis seems to fail so miserably when it attempts to direct this faculty at its own extracurricular activity. It is even more deplorable, therefore, that when such self-criticism is available and presented in such clear and articulate terms, as was Dr. Eisenschiml's talk, it should have been given such cavalier treatment. I would not presume to judge the absolute merits of the accompanying material in this issue, but to my mind that is just what it was with relationship to Dr. Eisenschiml's article, "Accompanying Material."

With regard to the substance of this talk it would seem that substantially the entire issue in question was designed to demonstrate and prove Dr. Eisenschiml's point. If this is to be the established policy of THE CHEMIST possibly the advice my attorney gave me regarding contracts would be well applied by your readers, "If you really want to know what it is all about, read the fine print first."

—A. B. CRAMER, F.A.I.C.

What Standards?

To the Editor:

In the October CHEMIST, Dr. William R. Sullivan observes (page 478) that "the manner of living and the methods of doing things are more likely to be the real reasons for discrimination, rather than than differ-

ences of religious beliefs or racial lines."

While Observer Sullivan does not define what he means by "manner of living and the methods of doing things, he presumably judges by conformity to his individual standards.

Many comments on discrimination have been made in the past, and I could not add anything that has not been said before. Certainly this spirit is not the noble tradition of this great country.

—DR. FRITZ ROSENTHAL, F.A.I.C.

A Challenge to Chemists

To the Editor:

Here are some aspects of my trip abroad which I think are of general interest and especially useful to many chemists and other allied scientists.

In Rome, September 7th, my daughter Dr. Eleanor Alexander-Jackson, a research bacteriologist, presented before the International Congress for Microbiology a paper on the bacteriology of a polymorphic micro-organism which she has been able to demonstrate in every one of hundreds of cases of cancer in both man and animals. The organism seems to be a *Mycobacterium*, resembling the Koch (T.B.) and Hansen (leprosy) bacilli. It has forms of virus dimensions, demonstrable not only in the cytoplasm of cancer cells, but even in their nuclei. As brought out by other authors in the papers presented in Rome, what is apparent-

ly the same organism has been reported by research workers in England, Canada, France, and Germany; but the possibility that cancer in man involves a characteristic microorganism continues to be denied and frowned upon by those who dominate the millions spent for cancer research, and who have for years used the slogan: "Cancer is not an infection."

On October 7th, Dr. Alexander-Jackson presented before the 6th International Congress of Leprosy in Madrid, a paper illustrated by many kodachromes, indicating that the transferable serial cultures which she had isolated from the blood of lepers (see *Int. J. of Leprosy*, 1951), actually represent cultures of Hansen's bacillus, the causative agent in leprosy, which since its discovery, 1873, has defied all attempts to culture it.

My trip abroad has thus highlighted a great challenge to chemists to find and demonstrate antibiotics against cancer and leprosy, two dreadful scourges of humanity. Specific vaccines and antisera are now being experimented with, and these may also be helpful in fighting and preventing these diseases. Full details of these cancer and leprosy researches are in course of publication, to be available to all scientists in the *Proceedings* of these Congresses.

—DR. JEROME ALEXANDER,
Hon. AIC

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"Pyrometer Thermocouple Calibration Data." Bulletin P1259. The Bristol Co. Waterbury 20, Conn.

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National Council Meetings

Meetings of the AIC National Council are scheduled to be held at The Chemists' Club, 52 East 41st St., New York, N. Y., at 6:00 p.m., on the following dates:

Jan. 13, 1954
Mar. 10, 1954
Apr. 14, 1954
May 12, 1954 — Asbury Park

November Meeting

The 292nd meeting of the National Council was held November 11, 1953, at 6:30 p.m., at The Chemists' Club, New York, N. Y. President Lincoln T. Work presided.

The following officers and councilors were present: C. C. Concannon, L. H. Flett, P. J. Gaylor, F. A. Hessel, M. J. Kelley, D. B. Keyes, D. Price, M. Sittenfield, F. D. Snell, R. Stevens, L. Van Doren, F. E. Wall, and L. T. Work. D. W. Young, general chairman of the 1954 Annual Meeting, and V. F. Kimball were present.

Dr. Work reported that he had attended the meeting of the Ohio Chapter, at which Dr. Ray P. Dinsmore received Hon-

orary AIC Membership, and the meeting of the New England Chapter at which Dr. Walter G. Whitman received Honorary AIC Membership.

The President announced that he had communicated with the chairman of the AEC, taking the position that it would be an asset to the Atomic Energy program if this were made available to industry with attention to security.

The Secretary announced that we now have an active membership of 2532 chemists and chemical engineers.

He announced with deep regret the deaths of James T. Goff, F.A.I.C., on January 4, 1953, and Gerald John Leuck, F.A.I.C., on May 13, 1953. A moment of silence was observed in honor of these Fellows.

A letter from the Chicago Chapter, with reference to revision of the Constitution, was referred to Benjamin Sweedler.

The Secretary presented a report from John Nair, chairman of the Committee on Membership, informing the Council that the Membership Committee will operate this year without change of personnel and that its goal is to maintain the number of elections to membership at around fifty a month.

The Secretary presented a report from H. Burrell, chairman of the Committee on Ethics, which was accepted.

The Committee on Revision of Constitution and By-Laws was requested to present its final version at the January meeting, having taken into consideration the suggestions received from the Chapters. Dr. Kelley informed the Council that the New York Chapter is opposed to the proposal in the revised Constitution that the grade of Associate membership be dropped. The Council then went on record to express the opinion that a class of membership be incorporated in the new Constitution to cover the four years between the B. S. degree and our present qualifications for Member membership.

Dr. D. B. Keyes reported, as chairman of the Committee on Manpower, the present status of correspondence with the Manpower Commission. President Work offered to cooperate with the Manpower Committee on selective recall.

Dr. Kelley stated that the Committee on Manual of Chapter Operations was beginning its work.

Mr. Young reported on the tentative arrangements for the Annual Meeting made at the New Jersey Chapter Council meeting. The following Annual Meeting Committees were presented: Chairman of the Committee on Registration, Chester A. Amick; Chairman of the Committee on Publicity, Dr. D. L. Cottle; Treasurer for the Meeting, Dr. W. Anthony Raimond; Chairman of the Special Events Committee, Dr. W. R. Sullivan; General Chairman, D. W. Young, and Chairman of the Program Committee, Dr. Max Bender.

Mr. Sittenfeld announced that the Honor Scroll Award of the Pennsylvania Chapter will be presented to Hugh W. Field on December third. The first meeting of the Pennsylvania Chapter was held in October — a panel discussion on the Chemist and Professionalism, presided over by Dr. Raymond E. Kirk.

Mr. Stevens announced that Honorary Membership would be presented to Dr. Walter G. Whitman at the November 18th meeting of the New England Chapter.

Mr. Concannon suggested that the Washington area should be a fertile field for the Membership Committee and that the Chapter is suggesting some revisions in the letter sent out by the Committee.

Dr. Kelley reported that the New York Chapter was holding successful meetings and that it will award Student Medals on March 4th. The Chapter is also experimenting with a "Chapter News Letter."

Mr. Flett suggested that the Institute organize conferences on professional subjects, with invited speakers and audience.

President Work discussed cooperation with the other societies on professional matters.

The following new members were elected:

FELLOWS

Fielding, John H.

Vice President, Armstrong Rubber Co., 475 Elm St., W. Haven, Conn.

Gunsberg, Ephraim

Assistant to Vice President, U.S. Vitamin Corp., 250 E. 43rd Street, New York, N. Y.

Hoffman, Henry Allen, Jr.

Research Chemist, Arthur D. Little, Inc., Cambridge, Mass.

COUNCIL

Kenney, Edward J.

Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City 2, N. J.

Locko, Benjamin S.

Technical Director, Norton & Son, Inc., E. 5th St. & Hobart Ave., Bayonne, N. J.

Lundbye, Axel

Director of Research, Kable Printing Co., Mt. Morris, Ill.

Outterson, Charles Renwick

Director of Research, Albemarle Paper Mfg. Co., Richmond, Va.

Sacher, Alex

Assistant Research Manager, Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.

Stern, Kurt

Adjunct Professor of Biochemistry, Polytechnic Institute of Brooklyn, 85 Livingston St., Brooklyn 2, N. Y.

MEMBERS

Francis, Warren

Field Editor, Reinhold Book Division, Reinhold Publishing Corp., 330 West 42nd Street, New York 36, N. Y.

Solomon, Jack Mitchell

Research Chemist, Herstein Labs., Inc., 66 Beaver Street, New York, N. Y.

Tokoli, Emery Gustavus

Research Chemist, Fine Organics, Inc., 205 Main St., Lodi, N. J.

Wolkowitz, Howard

Research Assistant, University of California, Dept. of Chemistry, 405 Hilgard Avenue, Los Angeles 24, Calif.

ASSOCIATE

De Angelis, Fortuno A.

Assistant to Director of Market Research, Foster D. Snell, Inc., 29 West 15th St., New York, N. Y.

REINSTATED TO FELLOW

Eckhardt, Henry, Jr.

Avondale Farms, Laurel, Maryland.

RAISED FROM MEMBER TO FELLOW

Nash, Nathan H.

Chief Chemist, Technical Director, Lanco Products Corp., 601 West 26th Street, New York 1, N. Y.

AIC Activities

C. P. Neidig, F.A.I.C.

Chicago Chapter

Chairman, Herbert F. Schwarz
Chairman-elect, Dr. Lloyd A. Hall
Vice-chairman, Clifford A. Hampel
Secretary, John Krc, Jr.
Treasurer, Albert S. Henick
Representative to National Council,
Dr. Gustav Egloff

Mass Layoffs of Chemists

The October 29th meeting of the Chicago Chapter featured a discussion of "Mass Layoffs of Chemists." Speakers were Dr. Norman A. Shepard, chemical director, American Cyanamid Company, and Victor Conquest, general manager, Research Division, Armour & Company. Both emphasized that they spoke as private individuals, not as management men; that having started as professional men, they were completely in sympathy with the problem, and now experienced in management, they would try to explain management's viewpoint.

Dr. Shepard said chemists would have to learn about this controversial subject on which they can become quite impassioned. "Some of you younger fellows may think it is bad now; you should have seen it in the old days. Research was a new toy to management; they all felt they ought to have it, but did not know how to handle it. When military contracts slackened after world War I, companies dumped chemists wholesale . . . During the 1920 and 1929 depressions, dumping was a question of company survival; research was still considered an overhead expense and temporarily dispensable . . . Since then dumping has been more of a sporadic thing."

Why does management dump chemists and what can the chemist do about it? Here are some of the reasons:

1. Economic recession: The chemist can do nothing except help the company over rough periods by his productiveness.

2. Reconversion after war: The chemist can do nothing.

3. Arbitrary research reduction by management: The chemist must accept his

responsibility as a part of management. Some young chemists lower themselves in management eyes by preferring to be considered as labor and joining technical unions.

4. Change in research and development program: Is the chemist wrong in assuming that top management should know positively whether a project will succeed? Here are some unpredictable factors that can cause failure, and the dropping of a project, hence layoffs:

a. Loss of government or other contracts: The chemist can do nothing.

b. Strikes: One company had a 7-month strike at one of its plants. It started because a supervisory job was open. The company did not think the man with most seniority could handle it, but agreed to a six-weeks trial when the union insisted. The man did fail and when the company decided to lay him off, the union in effect said that they would decide who got what job. The company would not let the union run its plant, so the strike was on. Dr. Shepard felt that the chemists could have been doing something to get the true story out, but "for six months they sat on their tails." Then the company decided the situation was hopeless and decided to close down the plant. When the decision was announced, the chemists started telling the true story and public sentiment in the community shifted when it was seen how ridiculous it was. Negotiations started and the thing was settled. The company gives the chemists and their educated, logical minds credit for it, but laments that they were so slow in getting busy.

c. Project bogs down: Chemists should work harder and get results. Management is not infallible, but it can use every bit of help the chemist can give.

5. Manpower Shortage: When supply is short, submarginal people are hired, but they will also be fired when the supply of people is better. However, at present it looks as though the shortage will get worse instead of better for at least three years. There is no solution; there will always be sporadic need for submarginal personnel, but chemists are not the only ones who get the ax, other submarginal people do also.

6. Incompetence of the chemist himself: This may be due to poor training, inability to utilize training, inability to get along with people, laziness, disloyalty, no imagination or creativity, too much ego. What can the chemist do? Only remember that "Good men get dumped only when an uncontrollable event happens, and they are never out of a job for long."

Dr. Shepard continued with a discussion of the relative advantages of mass-layoffs or gradual reduction in force. Although he admitted that the arguments for both methods seemed right, he seemed to favor mass-layoffs. Management prefers mass-layoffs for it saves money immediately. The attrition method can be more painful and a morale destroyer as the ax falls on one at a time. Dr. Shepard further said that it is not as bad to lose a job as it seems, for many successful men have been fired and then got ahead faster as a result of the experience.

Mr. Conquest then said, "One of the biggest failings of industrial research is that too much handling is left in amateur hands; ignorance on the part of some people of the job they should do . . . As an individual, don't be afraid of layoffs, be a little cocky. Get yourself on the ball. Be such a good chemist you don't have to worry . . . If you are worried about your job, get in there and pitch; your outfit will expand and you will actually create more jobs for more chemists . . . Demonstrate what an important part of the organization you are. Don't leave doubts as to the value of research in management's mind . . . Part of any lack of security feeling can well be the lack of a personal philosophy. Know what you are and play it to the hilt."

In the question period, Mr. Conquest answered a question on using mass-layoffs to weed out misfits, by saying that it should begin even before that. If a man doesn't fit in one place, he might elsewhere. It is management's obligation to give him advice; tell him his faults; help him to get his next job.

On the question of severance pay, Mr. Conquest said that severance pay should be as generous as possible. It will probably vary from company to company.

Asked about contracts, both men were against them. Mr. Conquest said that he felt that contracts tend to perpetuate a

AIC ACTIVITIES

bad situation many times. Dr. Shepard said that if he thought a contract was the only thing that saved his job, he would quit.

One audience reaction was that research activities should follow the economic curve. In good times, research men should get out in production and help decrease costs and improve efficiency. In bad times they should do research to help the company broaden business.

Asked about transferring men to other projects rather than laying them off, Dr. Shepard felt it best for a man to be doing something in which he has experience rather than to be learning something new, although there are exceptions and each case has to be judged on its own merits.

Employment Problems of Chemists Over Forty

One of the outstanding experts in the country in the problems of older employees, Dr. M. J. Mack, director of the Retirement Planning Project, Industrial Relations Center, University of Chicago, will speak on "Employment Problems of Chemists Over Forty Years of Age," at the February 26th meeting of the Chicago AIC Chapter.

It is well known that the average chemist over forty years old has a tough time if, through no fault of his own, he is forced to look for a new position. Everywhere he goes he meets the same reception, no men over forty need apply. He is fortunate if he can, through the influence of one of his friends, gain entry into an organization to talk to someone in top management who is receptive to hiring older men. He is also fortunate if he can find a progressive company that is just starting a program in a field in which he has specialized. But too often he runs into "company policy" or the eternal search for youth.

The companies that have a policy of hiring only chemists right out of college are very often not aware of the damage they are doing themselves and the profession of chemistry as well as the community as a whole. Their policy prevents them from interviewing many competent men who have much to offer. Their short-sighted consideration of the book-keeper who runs the pension plan and

doesn't want too many "old people" on the roles works to their disadvantage. Their desire to get the maximum number of chemists for the minimum amount of money prompts them to pass up men who can produce and will produce in order to obtain recent graduates who are really more questionable risks.

What can be done about these problems? Is there any solution that the profession as a whole can adopt? What can and should the individual chemist do when he finds himself in such a situation? Is it true that all major inventions are made by youths under twenty-five years of age? If it is true, does that mean that only youths should be employed on the ordinary chemical developments that are the result of a large "team" of chemists and engineers working together? Can management use its research dollar to better advantage by revising "company policy" that prevents hiring the older man? Is the chemist who specializes too much when he is young asking for trouble when he gets older? What can a chemist do when he finds that he is out of a job, over forty, a specialist, and no company wants men who are experts in his field? Should he lower his salary requirements to compete with recent graduates, or go back to school and try to become a "general chemist", or should he leave the profession and try something else?

These and other aspects of the problem will be discussed by Dr. Mack on February 26th, at the Chicago Engineers Club, 314 South Federal Street. For reservations call Ed Rapkin at YArds 7-4100, Ext. 384. The meeting is open to all who are interested.

January Meeting

Morris T. Carpenter, administrative director, Research Department, Standard Oil Company (Indiana), will speak on "Rewards for Chemists — Financial and Other," at the January 15th meeting of the Chicago Chapter. Mr. Carpenter will discuss practical methods of rewarding individuals for their achievements as practiced by many large chemical companies today. The meeting will be held at the Chicago Engineers Club.

Washington Chapter

Chairman, Alexander Leggin
Vice Chairman, P. E. Reichardt
Treasurer, John Williams
Secretary, Wesley Koster
Representative to National Council,
Alexander Leggin

October Meeting

The opening meeting of the season was held at Bonat's Restaurant at 12:15 p.m., October 14th. It was the opinion of the members present that luncheon meetings of the type previously held were most suitable for the regular monthly activity, but that occasional meetings in other areas and at other times would be appropriate at the discretion of the president. In the discussion of activities, it was suggested that the Chapter might place more emphasis upon performance of the fundamental purposes of the INSTITUTE to aid the chemist professionally. A list of several possible ways in which to accomplish these objectives was distributed to the members with the request that they be reviewed and commented upon at the next meeting. Additional suggestions, preferably in writing, were solicited, with a view toward broadening the outlook and crystalizing the important aspects of what should be done.

Dr. Richard L. Kenyon, F.A.I.C., editor of the ACS publication, *Journal of Agricultural and Food Chemistry*, then presented a most interesting report of the viewpoints and attitudes of professionally trained chemical people in Europe, and the effects these have upon the development of the chemical industry there. It was surprising to note the considerable differences of opinion that exist among countries on this subject.

The date of the next meeting was announced as November 17th, at which Arthur A. Sloan, executive vice president of the Atlantic Research Corporation, will speak on "The Business of Synthesizing Organic Chemicals."

November Meeting

A luncheon meeting was held at Bonat's Restaurant, Washington, D. C., on November 17th. Chairman Alexander Leggin pointed out that the Wednesday meeting dates were conflicting with other chemical activities in the area, and sug-

gested monthly meetings on the second Tuesday. Future luncheon meetings will therefore be held on the second Tuesday of the month.

The Chapter will shortly assign certain members to serve on committees. The need for an early start on the annual achievement award is especially urgent.

Dr. Arthur H. Sloan, executive vice president of the Atlantic Research Corp., Alexandria, Va., gave a short talk on "The Business of Synthesizing Organic Chemicals. The subject involved the problems and experiences encountered by a research organization in attempting to meet the demands of our highly complex chemical industries, for "tailor made", often purely theoretical compounds.

New York Chapter

Chairman, Karl M. Herstein
Vice Chairman, Savery F. Coneybear
Secretary-Treasurer, Richard L. Moore
Representative to National Council,
Dr. Maurice J. Kelley

Young Chemists' Meeting

The annual Young Chemists Meeting will be held Thursday, January 7, 1954, at the Jacob Ruppert Brewery, 1639 Third Ave., (near 91st Street), New York.

Prof. Benjamin Harrow, F.A.I.C., chairman of the Department of Chemistry of the College of the City of New York, will speak on "Exploring the Frontiers of Chemistry." Chemistry students, both undergraduate and graduate, as well as young chemists who have recently finished college, are particularly invited.

Other features of the evening will be the availability of special blends of beer not usually available, pretzels, a songfest, entertainment by an organist, and guided tours through the brewery.

There is no charge for attendance at this meeting which is designed to afford young chemists just embarking on their professional careers an opportunity to meet other chemists and to learn of the more serious activities of the AIC.

Technical Writing

Robert Gunning, director, Robert Gunning Associates, spoke on "How to Improve Your Technical Writing," at the second annual joint meeting of the New York Chapter, AIC, and the New York

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Section of the American Chemical Society. John Kotrady, F.A.I.C., of The Texas Company presided. Mr. Gunning described his Fog Index which usually ranges from 10 for the modernized *Wall Street Journal* to over 17, perhaps as high as 25, for some of the more ponderous technical journals.

The four-hundred persons who attended this session listened to the new principles of technical writing which, Mr. Gunning opined, should apply to all facets of industry — to technical articles in magazines, reports of plant division heads to superiors, notices on bulletin boards and all industrial communications. Too many technical writers forget the need for communication — passing along their ideas in a form most easily assimilated. The real offender is the writer who uses big words just because they are big, and not because they have any special meaning. He will write "utilization" when he could write "use"; he writes "optimum" when he could use a word like "best." The most familiar words are best. Edgar Dale of the Ohio State University made up a list of 3000 words known to 80 per cent of fourth grade children. The average adult understands over 10,000 words. Too many persons, when about to make a technical report, look up the records to see how reports have been phrased in the past. This is retrogressive. Writing according to the Gunning theory could still express originality and reflect the character of the author. The application of a Fog Index will aid the technical writer to promote readability and clarity.

To compute the index, one takes a sample of writing at least one-hundred words long and finds the average words per sentence. Divide the total number of words by the number of sentences, which

gives the average sentence length, or SP — sentence pattern. Then count the number of words of three syllables or more per 100 words — the PS, or polysyllable factor. Add the two factors and multiply by 0.4. Presto! The Fog Index!

(A limited number of copies of Robert Gunning's paper on "How to Improve Your Writing" are available on letter request to John Kotrady, The Texas Company, 135 East 42nd St., New York 17, N. Y.)

Western Chapter

Chairman, Peter Stupin

Vice Chairman, Dr. Kenneth Newman

Treasurer, Carleton F. Smith

Secretaries, Blanche C. Simons and

Paul C. Ressler

Representative to National Council,

Dr. L. F. Pierce

A Job for the Chemist

At the December 8th meeting of the Western Chapter, Harry V. Welch, chief chemist and director of the Western Precipitation Corporation, spoke on "Our Diminishing Natural Resources: a Job for the Chemist." Despite the studies that indicate diminishing natural resources, not only in the United States but elsewhere, Mr. Welch believes that resources are both diminishing and, at the same time, increasing, depending on how the data are defined and interpreted.

"It is true that the cream has been skimmed from our available resources. Most of the high grade ores have been well-worked. The big job remaining for the chemist, chemical engineer, and other technical men is that of finding economical methods for extracting metals and chemicals from available lean sources.

"Many processes have been developed to extract products from the sea, air, plants, and the earth — where the products exist in low concentrations. Much more of this type of development must continue if we are to look forward to a better living standard throughout the world. This will call upon increasing technical ingenuity in getting more from fewer resources.

"Perhaps the most important future source of energy is that derived from solar radiation. Another important supply of future energy is that resulting from

nuclear fission. Shale oil can be an important source of energy and chemicals in the West. Many problems in the distribution of water over large arid parts of our country can bring new industry and agriculture which, in turn, will be important users of chemicals.

"The recovery of sulfur from petroleum refinery waste gases and also as a by-product in smelting will loom as important future sources of this material. Recovery of zinc, nickel, tin, lead, copper and iron from slag piles and low grade ores must be looked upon as playing a more important role in the future of our economy.

"We have only scratched the surface in making efficient use of our resources. The future is largely in the hands of the chemist."

Will You Come

Jan. 7, 1954. New York Chapter, "Young Chemists' Meeting." Ruppert's Brewery, 1639 - 3rd Ave. (91st St.), New York, N. Y. Tours will be available starting at 7:15 p.m. Meeting in Tap Room at 8:30 p.m. Speaker, Prof. Benjamin Harrow, chairman, Chemistry Dept. C.C.-N.Y., "Exploring the Frontiers of Chemistry."

Jan. 15, 1954. Chicago Chapter. Dinner meeting. Chicago Engineers' Club. Speaker: Morris T. Carpenter, Administrative Director, Research Dept., Standard Oil Co. (Indiana), "Rewards for Chemists — Financial and Other."

Jan. 19, 1954. New Jersey Chapter. Military Park Hotel, Newark, N. J. Dinner 6:30 p.m. Meeting 8:00 p.m. Speaker Dr. E. C. Easton, dean, College of Engineering, Rutgers University, "The Effect of Supply of Energy on World Civilization." The N. J. Chapter will be host for the 1954 AIC Annual Meeting, and General Chairman, David W. Young, will present a progress report on plans for this event. Reservations: Dr. W. R. Sullivan, Hoffmann-La Roche, Inc., Nutley 10, N. J.

Feb. 2, 1954. Washington Chapter. Luncheon Meeting. For information:

Wesley Koster, National Production Authority, Washington 25, D. C.

Feb. 26, 1954. Chicago Chapter. Engineers Club, 314 South Federal St., Chicago, Ill. Speaker, Dr. M. J. Mack, "Employment Problems of Chemists Over Forty." Reservations: Ed Rapkin, Research Division, Armour & Company, 1425 West 42nd St., Chicago, Ill.

Mar. 2, 1954. Washington Chapter. Luncheon Meeting. (See item Feb. 2nd.)

Mar. 4, 1954. New York Chapter. Student Award Meeting.

May 12, 13, 14, 1954. AIC Annual Meeting. Berkeley-Cartaret Hotel, Asbury Park, N. J. General Chairman, David W. Young, Treasurer, Dr. W. A. Raimond. Chairman of Registration, Chester A. Amick. Chairman of Publicity, Dr. D. L. Cottle. Chairman of Special Events, Dr. W. R. Sullivan. Chairman of Program Committee, Dr. Max Bender. Chairman, Committee on Arrangements, Dr. Albert B. Scott. Honorary Co-Chairman, Dr. Randolph Major.

Award of the 1954 Gold Medal to Dr. William J. Sparks.

May 12, 13, 14, 1955. AIC Annual Meeting. Chicago, Illinois. The Chicago Chapter has appointed Clifford A. Hampel to initiate arrangements.

May, 1956. AIC Annual Meeting. Tentatively scheduled for Washington, D.C.

Appointed: By Dr. Johan Bjorksten, F.A.I.C., president of Bjorksten Research Labs., Inc., Henry Tovey as senior literature chemist in charge of the Washington, D.C. literature research branch. James W. Perry, F.A.I.C., remains as consultant and also in charge of a Government-sponsored program for developing machine methods in searching and correlating scientific information.

OPPORTUNITIES

Opportunities

Doris Eager, M.A.I.C.

AIC members who are seeking positions may place notices in this column without charge.

Positions Available

Woman for scientific editorial work. Typing, proof-reading, form-letters. Mid-town Manhattan. Small office. Opportunity. Around \$70.00. Box 11, THE CHEMIST.

Chemist-Manager, for long-established analytical and research laboratory already staffed with competent personnel. Analytical work in drugs, insecticides, essential oils, foods. Requires man with sales ability, ambitious to expand business with possible view of acquiring financial interest later. Box 13, THE CHEMIST.

General Sales Manager. Chemist, generally familiar with Agricultural Chemical industry. To participate with President and Technical Director in formulating general company policy. Responsible for all Sales, Sales Promotion, Advertising and Merchandising activities. To manage the sale of existing products and develop plans for introduction of new products, including channels of distribution, types of customers, method of sale. Age 35-45. Eastern Seaboard. Base salary, depending on background and experience, up to \$14,000. Box 15, THE CHEMIST.

Positions: At the new Research & Development Laboratories, Office of the Quartermaster General, Natick, Mass.:

GS-13, \$8360: Supervisory Chemist (Adhesives, Section Chief); Supervisory Chemist (Protective Finishes, Section Chief); Supervisory Technologist (Paper & Paper Products, Section Chief).

GS-12, \$7040: Technologist (Test Coordinator, Chief).

GS-11 \$5940: Chemist (Protective Finishes); Biologist (Insecticides & Rodenticides); Physicist (Materials Evaluation); Chemist, (Film, Filaments & Coated Fabrics); Physicist (Personnel Armor); Technologist (Specifications Office).

GS-9, \$5060: Technologist (Films, Fila-



ments & Coated Fabrics); Chemist (Insecticides & Rodenticides); Technologist (Paper & Paper Products).

GS-7, \$4205: Chemist (Chemicals & Chemical Processes); Chemist (Fungicides & Germicides).

Request Form 57 from Department of the Army, Office of the Quartermaster General, Washington 25, D.C. Forward form to Civilian Personnel Office at above laboratories.

Chemists Available

Chemist, F.A.I.C., M.S., 1940 in chemical economics. Thirteen years experience in administration, industrial planning, foreign trade, laboratory supervision. Assisted in post-war development of Japanese chemical industry. Publications. Age 36. Desires opportunity in administration, sales, public relations, market research or related field. Box 10, THE CHEMIST.

Chemist: F.A.I.C. Woman wishes position involving literature and patent surveys and searches. Abstracting, translating, compilation of chemical data. Fluent French and German. Box 12, THE CHEMIST.

Chemical Patent Attorney, D.C. Bar, former Examiner, seeks responsible position in New York city with corporation; 6½ years diversified experience, infringement investigations, applications, appeals, interferences, licensing with private and governmental agencies; 10 years engineering and research experience. Box 14, THE CHEMIST.

Pharmaceutical Chemist: F.A.I.C. B.S. in Pharmacy; Ph.D. (1945) Organic Chemistry. Diversified experience, includ-

ing supervisory, in the synthesis and development of pharmaceuticals from the laboratory through full scale production, including formulation work. Publications. Age 33, family. Desires challenging opportunity with good growth potential. Box 16, THE CHEMIST.

Chemical Executive: Consultant. Seeks challenging position to make full use of administrative ability—scientific and business knowledge in plastics, resins, pharmaceuticals, foods, etc. 14 years of progressively difficult experience. Past 9½ years, director of a chemical laboratory conducting research-development, product evaluation, quality control. Box 18, THE CHEMIST.

Consultant-representative: F.A.I.C. Available for exploration-contact-liaison work in Southern California on daily fee or job basis. Highest references. 25 years lab, manufacturing executive, and sales experience. Box 1-10, THE CHEMIST.

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For Your Library

Hydrazine

By Charles C. Clark, Mathieson Chemical Corp., Baltimore, Md. 1953. 132 pp.

For the organic chemist this summary of the literature on hydrazine chemistry will be of real assistance. Information has been collected from scientific journals, patent literature, reference books and other widely scattered sources to make a comprehensive compilation of the complexities of hydrazine chemistry. Inorganic chemistry, physical properties, and the organic chemistry of hydrazine are treated very fully, first; then, the use of this chemical and its derivatives; its toxicity and handling. Analysis of hydrazine is given in an appendix as well as a glossary of hydrazine derivatives.

—DR. FREDERICK A. HESSEL, F.A.I.C.

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The Proteins: Chemistry, Biological Activity and Methods

Vol. I, Part A. H. Neurath and K. Bailey,
Editors. Academic Press, Inc. 548 pp.
6½" x 9½". \$12.00.

Proteins have a coordinating role in nature. So far only the living cell has been able to synthesize proteins. Enzymes, antibodies, viruses, respiratory metallo-compounds, some toxins, and some hormones are also proteins. It appears that most proteins within the living cell have some catalytic function. It is not known, however, how the proteins are synthesized by the living cell.

If the first seven chapters of *The Proteins* are representative of the complete treatise, this work should prove to be indispensable to those engaged in protein research.

—DR. HENRY TAUBER, F.A.I.C.

Chemical Constitution

An Introduction to the Theory of the Chemical Bond. By J. A. A. Ketelaar. The Elsevier Press. 1953. 398 pp. Price \$6.50.

Dr. Ketelaar, professor of physical chemistry in the University of Amsterdam, has met a real need in the publication of this study of the nature and problems of the chemical bond. Chemistry, as he points out in his Introduction is "no longer natural history in which students are told that sodium chloride is by nature just colorless and readily soluble in water . . ." He must now understand the interaction between the atoms which determine chemical properties.

Each of the different points of view

from which the chemical bond can be treated is discussed here more thoroughly than in any other work seen by this reviewer, and use has been made of very recent results which throw new light on well-known facts. The more purely mathematical sections are printed in small type and can be omitted for a first reading but furnish valuable assistance to the student seeking detailed quantitative information.

This book is a must for all chemists who want to keep up to date in fundamental chemical theory.

—DR. FREDERICK A. HESSEL,
F.A.I.C.

Periodica Chemica

Second edition. Prof. Dr. Maximilian Pfluecke and Alice Hawelek. 1952. Akademie-Verlag GMBH, Berlin. Verlag Chemie, GMBH, Weinheim Bergstr. \$8.40 (U.S.)

This is a list of international scientific and technical publications, with addresses of the publishers, related to the general field of chemistry. Authors, editors, technologists, will find it useful in documenting works with reference to the literature by the standard abbreviations for international periodicals.

Chemical Books Abroad

RUDOLPH SEIDEN, F.A.I.C.

C. C. Buchner Verlag, Bamberg: *Buch der Abkuerzungen*, by P. Spillner and H. Goettling; 1952, 159 pp.—A useful "dictionary" of thousands of abbreviations found chiefly in German literature.

Verlag Gustav Fischer, Jena: *Geschnittene Drogen*, by U. Weber; 3rd ed., 104 pp. (202 ill.), DM 5.—A text and laboratory book for the microscopic examination and chemical determination of plant materials used as drugs and in drug mixtures. Excellent drawings, made by the author, are even more helpful than the concise description of each drug.

Athenaeum-Verlag, Bonn: *Schoepfer des neuen Weltbildes*, by H. Hartmann; 1952, 327 pp., DM 14.80.—Brief biographies of the following 17 outstanding physicists and their contributions to the progress of their science in the first half

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of the twentieth century: Roentgen, the Curies, Marconi, Planck, Einstein, Rutherford, von Laue, Hahn, Lise Meitner, Strassmann, Bohr, Heisenberg, de Broglie, Dessauer, Bothe, and Jordan. This easily read book is well illustrated.

Terra-Verlag, Konstanz: *Pharmakologisches Handbuch fuer tieraerztliche Praxis*, by W. A. Schmidt-Trepton; 1952, 362 pp., DM 18.60.—An up-to-date pocket-book describing in alphabetical order pharmaceuticals used in veterinary medicine, with information as to composition, indication, action, and dosage.

Libreria Scientifica Carlo Manfredi, Milano: *Guida Bibliographica Internazionale per il Chimico*, by N. Gaudenzi; 1952, 513 pp., Lira 4,000.—This international bibliographical guide for the chemist is a first attempt of a systematic listing of the most important French, English, and German books and journals dealing with pure chemistry and chemical industries. Only publications which are not out of print have been considered. There are over 3200 books and over 1000 journals—with all the necessary bibliographical data—classified under 33 headings. An English introduction and three indices (author, editor, and subject) are of great help to the American user of this volume which, typographically, is outstanding.

Sandoz, A. G., Basel: *Calcium*, 147 pp. (38 ill.).—Physiology, pharmacology, and clinical importance of calcium are discussed by the research workers of Sandoz—the firm which in 1927 offered the first stable calcium gluconate solution to the medical profession. It is suggested that in a new edition of this monograph the great importance of calcium therapy for animals, particularly for downer-cows, be discussed in a special chapter.

Condensates

Ed. F. Degering, F.A.I.C.

The policy of allowing a technical man to spend time working on his own ideas has paid off in new products, according to C. W. Walton of Minnesota Mining and Manufacturing Company.

Before the nutritional research area, the corn-bog ratio was 12 bushels of corn for each 100 pounds of pork, and the feeding time was 10 to 11 months. Now, only $5\frac{1}{2}$ bushels of corn with 50 pounds of feed supplement are needed and the feeding time is about 5 months. One state experiment station estimates that this could save 24 million dollars in feed each year in the state in addition to savings in the time to raise pigs to market weight. The secret of this very gratifying accomplishment lies in the feed supplements which balance the diet and increase nutritional efficiency.

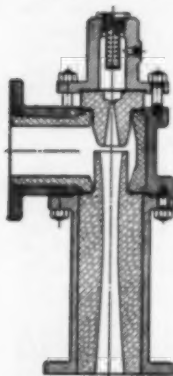
Oil storage tanks that resist corrosion, electrolysis, and fire, are being made out of bolted, glass-reinforced plastic. The tanks weigh one-fourth as much as comparable steel tanks and are made in 250-barrel and 500-barrel sizes. At present, they cost about a fourth more than steel tanks.

The "complete answer" to stream pollution by pulpmill waste may be in the use of magnesium bisulfite as the cooking agent in woodpulp production instead of the present use of calcium bisulfite.

Address Change: Please change the fifth name and address on page 539 of the November CHEMIST, to read:

Sowerwine, Elbert Orla, Jr.
Wigton-Abbott Corp.
Wapiti, Wyoming

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